# BARODA PALACE: THE TOWN RESIDENCE OF H.H. SIR SYAJI RAO, G.C.S.I., Maharaja Sahib Gaekwar.

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I COME before you this evening with considerable diffidence, because I feel that the description of a palace built on the other side of the world, in a style with which few of you are acquainted, can scarcely enlist your sympathies; and although I purpose to touch lightly other matters in connection with our art, I am but too conscious that my subject falls below the high standard of the excellent Papers you are in the habit of listening to in this room. On the other hand, the ties between India and England are continually drawing closer, and the interests of the two countries becoming more intimately involved. The palace of His Highness Sir Syaji Rao, Gaekwar, is probably the most costly structure erected by a private individual during the present century. It seems expedient, therefore, that a description of it should find place in the annals of the Institute, and on these grounds I beg to claim your indulgence this evening.

The name of the palace, Lakshmivilâsa, is derived from Lakshmi, the goddess of wealth and prosperity, and Vilâsa, play or sport. The title may be rendered in English as the abode where wealth and prosperity revel. The building was designed and actually commenced by the late Major Mant, R.E. When this gentleman died, the general drawings to a scale of eight feet to the inch were completed; the half-inch scale enlargements for the entire lower storey, and the better part of the second storey; also a considerable number of full-size working drawings of ornament by the late Mr. Hasjee, a native draughtsman specially trained for this work. In actual work, the foundations were laid, and the superstructure raised some six or seven feet above the top of the plinth. It was at this stage that His Highness the Gaekwar asked me to take over the work, and to carry it forward to completion, as far as possible according to the intentions and designs of Major Mant. This I have conscientiously done. Whatever merits the building possesses are due to the ability of Major Mant and his assistant, Mr. Fotheringay. The one or two alterations which affect the appearance of the building, and for which I consider myself responsible, I shall explain further on.

The building measures about 500 feet in length by 150 feet in breadth, and, roughly speaking, covers an area of 60,000 superficial feet. Calculating the towers full to the base of the finials, the building contains above the ground-line 2,930,000 cubic feet. The total cost, including the mosaic work and decorations, amounted to thirty lacs of rupees, which works out to about 1*s.* 2½*d.* per cubic foot enclosed. At the average rate of exchange, the cost would be about £180,000. The structure consists of three groups of apartments: the public rooms, with their courtyard approached by a porch on the north side; the Maharaja's rooms, with their

two courtyards approached by a porch on the west side; and the ladies' apartments, with their courtyard approached by a porch on the south-west. The palace stands by itself in an open park. The materials employed are brick, with sandstone facing throughout; the greater number of the columns are of marble. A considerable quantity of red sandstone from Agra, and blue trap from Poona, is made use of for the purpose of varying the colours of the surface. The floors were intended to be supported by teak-wood beams and joists, but at my earnest request they were made fireproof throughout by iron joists and girders carrying arches on the lower flanges, and filled in with concrete. These floors are heavy, but perfectly noiseless, and under ordinary circumstances fireproof, as only the lower flanges of the girders are exposed.

In describing the building it will be convenient, I think, if I divide my subject into the following heads:—(*a*) The Plan of the Palace; (*b*) The Exterior; (*c*) The Interior.

(*a*) The Plan, as an architectural composition, has many commendable points. It must be kept in view that the native Rajas and chiefs of India are passing through a transitional period; that an old palace like that at Ambur would be about as useless to the present Gaekwar of Baroda as to an ordinary English gentleman. An architect must, therefore, look well in advance, and, in planning, consider the future more than the present. Most of the old palaces of India have been built at various periods, but, when complete, they all contain certain well-marked features. First, the entrance gateway, surmounted by the Nowbut Khana, or drum-house. This leads to an open courtyard, around which are grouped the public offices of the Raja; and at the palace side, the Hall of Audience, or Durbar Hall, sometimes open as at Agra, or sometimes with its separate courtyard as at Ambur; beyond this a courtyard around which are situated the private apartments of the Raja, his relatives and mankarees; and beyond these, again, an inner courtyard surrounded by the Zenana, or ladies' apartments. The whole of these groups are either enclosed by high walls, or have houses of one storey built up quite close to the exterior. Applying this typical plan to Lakshmivilâsa, we find Major Mant embodies the same well-marked features, and arranges them in the same way, but with an eye to an architectural elevation.

Now that the building has been actually constructed, we may learn from it two lessons. First, that it was an error to have made the major axis of the palace lie north and south, in place of parallel with the sun's path east and west; and, secondly, having so placed the axis, deep verandahs should have run along the west face. In the tropics too much attention cannot be bestowed on the position of the main axis of a building. In Baroda, for instance, the sun practically does not travel north, and a building lying parallel with the sun's path, while requiring verandahs on the south, should have none on the north side; and, again, in buildings situated as this one is, the rooms on the west without deep verandahs are scarcely habitable after three o'clock in the afternoon. I imagine Major Mant to be in no way responsible for the error of placing the axis of the building north and south. Possibly he conformed to native prejudice—although I must say I have never yet met a native who did not at once give way on this point when the matter was fully explained to him. In regard to the absence of verandahs on the west face, I cannot help thinking that Major Mant erred in judgment: he wanted doubtless to give a solid character to the building, and sacrificed comfort to gain this end. Apart from these slight errors of judgment, Major Mant has grasped the problem of the plan in a masterly way, for it exactly coincides with the typical plan described above, while the opening out of the sides at once adds the external character which so many old Indian palaces lack. In omitting verandahs on the west face, I am afraid Major Mant shirked a problem which every European architect has to meet when designing for the East. These necessary, and indeed in some positions indispensable, features always convey to the beholder a light or cage-like appearance to the exterior, which detracts from the solidity and

consequently the dignity of a structure; and there is in most designs by European architects a disposition to omit verandahs as much as possible. I cannot remember any modern Eastern design in which the amount of wall-space and the amount of verandah are justly balanced. Either we have too much verandah, which conveys a fragile, unstable appearance, or too little, which suggests a hot and uncomfortable interior. I will return to this point again when dealing with the exterior. In India, where one practically lives in the open air the greater part of the year, it is desirable that rooms on the east, south, and west should not only be shaded by verandahs, but, if possible, there should be in front of every room an open terrace.

It will be seen that such features can readily be secured if the rooms are stepped back as they rise in storeys; and in some old palaces and buildings this expedient is adopted. Although a good sky-line may be thus obtained, the practice is hardly commendable, on account of the elevation becoming less imposing as the building is approached. There is only one palace in India which I have seen wherein the conditions of privacy, these features of terraces in front of rooms, and at the same time an imposing elevation are all secured, and that is the old palace of Dattia, a city about twenty miles north of Jhansi. The plan of this building is so instructive that a short description of it may not be out of place. Dattia palace is built on a hill. In plan it is a perfect square, approached from the city side by the usual outer courtyard. By reducing the number and width of the rooms as the floors rise, open terraces are provided in front of each room on the *inside*, while the external walls rise vertically to the full height of the building. I regret that I was unable to obtain any photograph of this remarkable building, but the framed oil sketch on the wall will give you some idea of the outline. Even now, half-ruined and shorn of its external features, it possesses great beauty; and when all the domes were covered with Mooltan tiles, and the outer surface softened with the exquisite lace-like perforated marble and stone common to this style, the general effect must have been singularly beautiful and pleasing.

I will now take up the second section of my subject—(*b*) The Exterior; and here I feel it incumbent on me to render an account of my stewardship. In comparing the drawing of the building as designed and the drawing of the building as finished, alterations are observable which undoubtedly affect the general appearance of the building. First, in the roof of the Durbar Hall; secondly, in the main tower; and thirdly, in the principal dome.

In regard to the first, I hold (and doubtless there are many architects who share my views) that the roof of a building gives a stronger impress of character or style than the mere language of detail. Whether residence in a hot climate has made me keener or over-fastidious I cannot say, but to me the admixture of flat roofs of one material and pitched roofs of another material grates as much as seeing a gentleman in a frock-coat finished off with a bowler. When I turn to the works of the past I find the old architects most particular to preserve unity in their roofs. Domes and cupolas are associated with flat roofs, or roofs of low pitch; spires and flèches with roofs of high pitch. Indeed, in the north of Italy it was not uncommon when the main roofs were pitched to hide a dome externally by a series of galleries roofed with tiles like the main roof, and so to preserve unity. With an eye tutored to flat roofs, the modern fashion of sticking little pieces of flat on the sides of slopes seems to me a fair matter for discussion. If these pieces are better flat, why not make the whole flat? The matter doubtless is one of feeling, but the eye becomes so easily tutored to anything bad that we should always guard ourselves from retrograde movements. Holding these views, whatever way I looked at this pitched roof among the flats of Lakshmivilasa, it became an eyesore; and as His Highness the Gaekwar wanted a large terrace for dancing, he readily fell in with my idea of making the roof of the Durbar Hall flat.

The second alteration affecting the external appearance was remodelling the tower. At the time of Major Mant's death he had discovered that the weight per foot superficial on the foundations of the tower was from two to three tons, and he had written a letter to the State authorities begging that this part of the work might be taken up and the base widened, so as to relieve the pressure on the foundations. This letter was placed before me. I recommended the State to allow the work to stand, because in my opinion the tower was the least satisfactory part of Major Mant's design, and the large clock and chimes objectionable, partly because the clock would give the building a public rather than a palatial appearance, and partly because the chimes would be a nuisance to the occupants. I know few things more unpleasant during a hot and restless night than to hear every quarter of an hour of one's existence merrily but mockingly chimed away to eternity. If these features were omitted I undertook to build the tower to the same height without laying on the foundations more than $1\frac{1}{4}$ ton per foot, and the Government of the State agreed to the alteration.

The design of the main dome I altered for constructive reasons. It was designed of brick faced with stone, and I feel certain Major Mant would himself have altered this system of construction in the working designs. This form of construction is not to be recommended even in walls; but domes so constructed could not stand, I think, unless both the brick and the stone were each by itself sufficiently strong to ensure stability. Two different materials, subject to different degrees of compression and different degrees of expansion and contraction, cannot jointly perform service. I constructed the dome entirely of stone without a centre, and, having to re-design it, I lighted the base with windows.

With these three exceptions I have made no alteration which would affect the appearance of the structure, endeavouring according to my lights to carry out the structure entirely as it was originally designed.

The style of the building, to use an objectionable word, is a late period of what Fergusson happily calls Hindoo-Saracenic. It stands about midway between the old red sandstone work at Agra and the marble-work which succeeded it, when the ornamentation bore the distinct impress of European hands. Although most of the detail seems to come from Bhurtpoor, there is in the working drawings especially a feeling of regard for the purer local Guzerati style; and this feeling becomes more marked as the working drawings of the lower storey approach the south side, where local forms have been cleverly fused with the more florid art. The bedpost form of column—a characteristic of the late Hindoo-Saracenic—is unknown in Guzerat and Katiawar, and it is not an easy thing to fuse such antagonistic forms, and at the same time to avoid the grotesque. One of the defects of the style to an English eye is the general monotony of the outline, the constant repetition of vertical and horizontal lines; and this monotony grows with familiarity. Turning to the palace under consideration, too much praise cannot be bestowed on Major Mant for the way in which he has broken the sky-line in the Zenana face by the egg-shaped domes. They are most pleasing, and eminently suggestive of great variety of treatment.

To sum up, the exterior, from an architectural point of view, is a distinct advance on most modern Indian buildings, as a successful attempt to combine native details with the ordinary requirements of a modern palace and arrangement of rooms. Beyond this, however, I do not consider that it solves any architectural problem. A modern Indian building, apart from the different treatment arising from aspect, requires a specific treatment on the south, east, and west—a treatment which is acknowledged in almost every building yet constructed, but which has not yet, so far as I am aware, passed into a lithic form. What I allude to is this: In an arcade or verandah in front of rooms, say 18 feet high from

floor to floor, it is desirable to have the lower 6 feet and the upper 2 feet of the external wall entirely open. Between these points the remaining 10 feet should admit air but not sunshine, and the two open spaces should be further protected by sunshades. In Calcutta, the City of Palaces, the old style is Palladian, and the 10 feet of space alluded to is closed by placing venetian frames between the columns.

These venetians are usually painted green, and take the place of blinds. In Bombay, at the time when the city suddenly rose in wealth and importance, a few clever architects introduced the then fashionable Venetian Gothic, and had these gentlemen remained in the country, I quite think they would have eventually evolved a style eminently suited to the requirements. As matters stand, however, arcades of arches replace the former Palladian style, and after completion all kinds of expedients are resorted to in order to block out the sun's rays. Thus it seems clear that neither trabeated nor arcaded verandahs exactly answer the requirements, both being subsequently considerably modified by blinds or woodwork. In many public buildings the Government authorities, with the most praiseworthy firmness, have discountenanced any such defacement of handsome façades; but the inmates suffer. In those parts of India where the old materials are found, and the old traditional arts still linger among the people, the native styles may be adopted wholesale fearlessly; and Colonel Jacob at Jeypore and Mr. Harris at Gwalior have done much and excellent work in this direction; but in the majority of places the old styles must be modified, not only to suit the requirements, but to suit the materials.

Mentioning Colonel Jacob's name, I trust it may not be out of place if I venture to express my high appreciation of the invaluable services he has rendered to Indian architects by the publication of the series of details of Indian architecture. I have seen buildings designed by Englishmen in a native style, carried out by natives themselves, with ornamentation of the most atrocious kind, and yet the public are so generally ignorant of detail that both they and the producers seem perfectly satisfied. This is the more to be wondered at seeing that in the case of the particular building I have now in my mind's eye, a walk of a few hundred yards down the bazaar, and a halt at probably the first sweetstuff-vendor's shop, would have shown the ornament intended by the architect in all its purity. Colonel Jacob's publications will do for Indian architecture what photography has done for painting generally. Builders in native styles will have as little excuse now for bad ornament as an artist in these days of photography has for careless drawing.

Speaking generally of our art in India, I think I may say that during my thirty-seven years' residence the progress has not kept pace with the progress in other parts of the world. Mere change of fashion has too often been hailed as actual progress; but people forget that the cutters, the cloth, and the tailors are the same—the fashion only has changed: Bombay, being the richest place, should have made greater strides than any other city.

One of the defects of the late Hindoo-Saracenic is its structural untruthfulness. At the same time it may be open to question whether our ideas on this point are not a little puritanical, for concealment of effort, and concealment of the means by which effects are produced, seem really to be a quality of high artistic manifestation; and most undoubtedly while the work is new, and the whole appears carved out of a solid block, this form of art possesses a charm of its own. Turning from the defects of the style to its beauties, we find it fairylike in lightness and marvellous in bold corbelling. Neither of these attributes appears commendable from a constructive point of view, and both cause the unfortunate builders a vast amount of anxiety; but the result, when achieved, produces that fragile look which seems a quality of simple loveliness. The central feature is 45 feet high, and projects 5 feet: it is surmounted by a stone Howda dome, and the whole of

this vast mass of masonry is apparently carried on twelve corbels! Of course, the stones of the side walls are carefully pinned into the main wall, and these carry the whole of the upper portion. Were it not for this expedient, the corbels would fail. Much of the corbelled work in other parts of the building is equally bold. There are two charming little balconies surmounted by stone hoods and domes on the south side of the building, well worthy of a glance.

In regard to detail, an architect inspecting the forms critically will see evidence of European feeling in much of the ornament and many of the forms. There is a thought of Venice in many of the arches, a more decided feeling of Gothic in others, and towards the south end of the building a distinct leaning to an earlier and somewhat purer type of art. Still I think, on the whole, you will acquit Major Mant of any desire to attain variety at the expense of unity, and this is probably the highest praise that can be bestowed on any modern work.

I now turn to the third head of my subject—the interior.* The surfaces of the floors are covered with marble mosaic, marble slabbing, or Minton tiles. These materials, which seem peculiarly suited to India, are in reality the worst that could have been selected. The natives of India in their houses invariably walk about without shoes—the wealthy in their stockings, and the poorer barefooted—and all complain that, except during the very hot weather, these materials strike coldly on the feet. It follows that the most costly mosaics are hidden by carpets; and in many apartments of this palace I am, by the desire of His Highness, substituting teakwood for tiles, or laying teakwood over the tiles. It was Major Mant's intention to make an extensive use of parquet floors, but the fierce heat of Baroda alternating with the excessive moisture during the rainy season would, I think, very soon destroy a parquet floor. This material has been used at Secunderabad with a result that can hardly be called satisfactory.

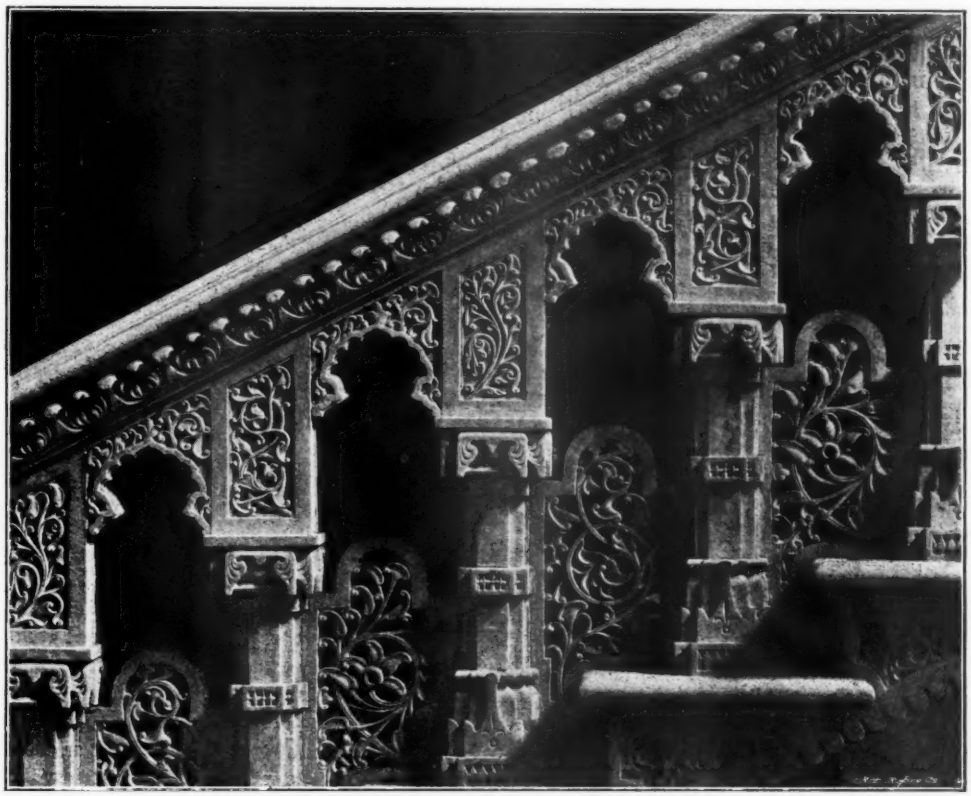
The Durbar Hall, at the north end of the building, is a handsome apartment, about 92 feet long by 54 feet wide, and 48 feet high to the underside of the ceiling. The floor is of Venetian mosaics, executed by the Venice and Murano Company, and put down by twelve Italian workmen, who spent about eighteen months in Baroda. The dado is of Carrara marble, inlaid with Venetian mosaics. All the spandrils of the openings are filled in with Venetian mosaics on a gold ground, and four recesses have groups of statuary representing Painting, Poetry, Sculpture, and Architecture, executed by the eminent Italian sculptor Signor Felici, who came to India expressly for the purpose of beautifying the building. A bronze figure by this sculptor adorns the standard of the main staircase.

The ladies' gallery is of elaborately carved teakwood filled in with the beautiful Deoder tracery from Pinjra. Four very beautiful stained-glass windows executed by Mr. Dix, of London, fill the eastern lights. The designs for the latter and for the mosaics were based on designs sent from India. The ceiling, I am sorry to say, is a failure. It was necessary to make it of some material which leaks would not injure, because it is quite impossible to prevent an occasional leak in a flat roof of such vast dimensions. After a good deal of discussion we hit upon enamelled iron, and obtained a specimen from an eminent firm in London. We subjected this specimen to every test we could think of but the right one! We did not soak it in a bath for three days and then expose its back to heat. We have found out, alas! too late, that this treatment crazes the surface, and causes pieces to detach themselves and fall. At the end of each rainy season the floor of the hall is covered every morning with small pieces of enamel,

* I may mention that Major Mant left no working drawings showing how he intended to finish the interior. The sections shown on the 8-feet-to-an-inch drawings contain indications of ornament too slight to be enlarged. The whole of the interior details were worked out entirely by myself.—R. F. C.

and this continues, according to the state of the weather, for several days. It is now about nine years since the ceiling was executed, and large quantities of the enamel have fallen. I wrote to the manufacturers, but they could suggest no remedy. How this material behaves in other places I know not. In India, I am sorry to say, it is a failure.

The walls are coated with fine Madras chunam. On a previous occasion when I had the honour of reading a Paper in this room I described this excellent material.* At Baroda, when I imported the men and materials from Madras, my Baroda workmen were much annoyed, and declared they could do as good or better work if I allowed them to use powdered marble



MARBLE BALUSTRADE OF THE MAIN STAIRCASE, BARODA PALACE. DESIGNED BY R. F. CHISHOLM.

and other ingredients. There were two recesses in the hall exactly similar, so I had a kind of competition, promising my Baroda workmen that if their work was as good as the Madrasees' work, I would not hesitate to send the Madras workmen back. When the two recesses were newly finished, there was no perceptible difference in their appearance; but, after the lapse of a month, the local work was riddled with fine cracks, something like the crazed glaze on Satsuma ware, and it lost lustre; indeed, the local workmen never again alluded to the subject. I may mention that most of the columns in the hall are of Carrara marble, and

* "Tiroomal Naik's Palace, Madura," by R. F. Chisholm [TRANSACTIONS 1875-76, p. 159].

although it is nine or ten years since the plaster was executed, the purity and texture of the surface of the plaster do not suffer by the juxtaposition of the white marble.

The main staircase [p. 425] is of Carrara marb'e of an Oriental pattern, and this I have decorated with gold lines picked out with fine lines of vermilion on either side, after the manner of the Delhi interiors. The effect is particularly good, the vermilion throwing a pleasing glow of richness into the marble and gold.

In both the apartments alluded to, the ornament is flat, and all variety is obtained by colour and gilding. In the remainder of the rooms I prepared the ornament round the doors and windows with raised plaster-work before decorating. I found it quite impossible to make drawings for all this ornament, and the system I adopted was as follows:—After the first smooth coat of plaster was dry, scaffolds were erected so that I could reach every part of the wall and ceiling. I then drew the ornament on the wall itself with charcoal—the workmen then traced my drawings, and the work was executed from these tracings. All the rooms with the exception of three were then painted and gilded. Neither the painting nor gilding in India is good of its kind. A firm in Calcutta, I believe, obtained experienced workmen from England, but the rates were more than I thought it advisable to give. The natives of India are most apt to learn anything, but in order to teach them you must be able to do the thing yourself with your own hands; I can gild better than they can, and paint better than they can, but in neither the one nor the other am I an expert. At my request His Highness obtained a good London painter and gilder, Mr. Tree, and the work done subsequent to this expert's arrival is almost as good as English work.

So far as I was able I regulated every tint applied to the walls, and painted pieces of all ornaments. It was while engaged on a piece of painting, towards the close of the undertaking, that the scaffold gave way, and among other injuries I broke my thigh-bone—but architects obtain no medals for wounds received in action!

It was His Highness's intention at one time to permit me to design all the furniture and fittings of the palace, in keeping more or less with the general style of the building, and so to spend the money among his own people and improve their arts. A large stock of timber was purchased for this purpose, but it was found that the time required was too great. The various rooms were eventually furnished by different eminent firms in London, Paris, Calcutta, Bombay, and Madras.

In addition to the furniture, His Highness has taken the greatest pains to stock his palace with articles of vertu—good oil-paintings, Sèvres vases, Minton and Doulton ware—and for sculpture, Signor Felici, who executed the bassi-rilievi of the Durbar Hall, has resided in India every cold season for the past five years, and executed many groups for His Highness of purely native subjects. Mr. Ravi Varma, of Travancore, a man of great genius, who unfortunately never had the advantage of proper academical training, was commissioned by His Highness to paint twelve large pictures of Indian mythological subjects, which now adorn the Gadi Room. You will see from the above that His Highness the Maharaja has not only been a liberal patron of the arts generally, but an especial patron of native art where native art existed.

In conclusion I would say that the arrangements made by Major Mant for carrying on the work were excellent. Mr. Hasji, the detail draughtsman, was educated by drawing from actual work, and on his death he was succeeded by Mr. Gumpnt Singh, who had a similar course of instruction in the first place under Colonel Jacob, and latterly under myself. Mr. Modi, the clerk of the works, held that post until ill-health compelled him to retire; subsequently death happily released him from a state worse than death. He was succeeded by Mr. Harrischund Gopall, who is only now retiring after serving the State for ten years. The cook's rooms and servants' offices, originally placed in the building, were subsequently

constructed on the outside. As it was considered too costly to adopt the style of the building, I employed a rustic half-timbered style, which lends itself admirably to adornment at the hands of native woodcarvers.

His Highness the Maharaja has been most anxious that the grounds and parks surrounding this and his other palaces should be laid out to the best advantage. With this end in view he obtained the services of Mr. Goldring, of Kew, providing him with an adequate staff of assistants. Mr. Goldring, who visited India at intervals and spent many months in the country, has carried out much valuable work to the entire satisfaction of His Highness.

## DISCUSSION OF MR. CHISHOLM'S PAPER.

Mr. Alex. Graham, F.S.A., *Vice-President*, in the Chair.

Mr. R. PHENÈ SPIERS [*F.*], F.S.A., said that fifteen years ago he had read a Paper before the Institute giving an account of Major Mant's works and describing his career. Major Mant was a Fellow of the Institute, and, he thought, the first engineer who had occupied that position. The general plans for the palace were commenced in India, but Major Mant brought them to England to work out and complete. Unfortunately, owing to speculation or some other cause, he lost his head, and the last month of his life he (Mr. Spiers) was engaged a good deal in going through the plans with him, and trying to assure him that certain risks he contemplated in the carrying out of the building were only illusory. He suggested that Major Mant should engage the services of a competent surveyor to calculate the exact weights. After his death, letters which came from India proved that before he left that country he had made all necessary calculations; he had found out that in certain cases they were defective, and had really provided extra foundations, so that his fears were purely imaginary. There may have been in the case of the central tower some additional foundation required, and the way the difficulty had been met by Mr. Chisholm in changing the design was an advantage. Nothing had given him (the speaker) more pleasure than to hear that this magnificent work had been carried out, so far as the exterior was concerned, in its entirety. Mr. Chisholm had shown the spirit of the true artist by recognising what there was of value in Major Mant's work, and in doing his best to maintain it, and he had further given his predecessor full credit in his Paper. He quite agreed with the author in the matter of the verandahs. Although he had something to do with the calculations, he really did not know which way the building faced, but he could quite understand that as it ran now it had great disadvantages. This led him to the point of the great difficulty he thought Indian architects had in designing their buildings to provide these verandahs. His hearers might, perhaps, wonder what he (the speaker) had to do with them, because he had never carried out anything in India; but it so happened that for many years the Government had sent over engineers to England, and he had the duty of educating them in architectural design. His desire, as far as possible, had been to give them, first, a general training, and then lead them gradually up to the study of the styles of their own country. He had, therefore, to see how far he could instil into them the proper principles to be observed when working out buildings actually in this style. The great trouble he experienced was to know how to advise them to deal with verandahs. Mr. Chisholm had explained that if a verandah were carried up the whole height it gave the building a fragile appearance; and that if it were set back in terraces it lost in effect, and became more or less like the pyramids of Egypt. The only way he could suggest that there should be some connection between the verandahs and the building at the back was, in the first place, to arrange, if possible, that the upper portion of the structure should always rise above the verandah, which would show that, at all events, there must be a solid wall at the back. Then, secondly, for the verandahs, as it was necessary that these should be carried on light supports, he could only suggest that at various intervals narrow projecting wings, fairly solid in appearance, should be provided, bringing them out to the front, and that the verandahs should be built in between them, and of such height and open construction as to allow the solid walls at the back of the building to be recognised as part of the projecting wings. He did not know whether any works had been carried out on that principle. There was one point on which they should like Mr. Chisholm to enter more into detail, as it was a subject of great interest—viz. how he constructed the central dome without centering. The question had frequently of late occupied the attention of the Institute. Professor Aitchison had read Papers in which he had pointed out the peculiar value of the researches made by M. Choisy in his book, *L'Art de bâtir chez les Byzantins*, which contained a number of expedients by which domes could be erected

without centering. It would be of great interest if Mr. Chisholm would give the principles he adopted for constructing the great dome without centering, and also how they managed to build the numerous ancient dome structures, which, he had no doubt, were all constructed without centering. He had great pleasure in proposing a hearty vote of thanks to Mr. Chisholm for his extremely clear and lucid Paper, for the valuable plans he had brought to illustrate it, and also for the very interesting specimens of carved work. What struck him more than anything else when Major Mant was at work was the extraordinary beauty of some of the details and their variety. Major Mant had told him it was done by the plasterer on the spot; that it was only necessary to give him the general idea of the scheme, and the workman would carry it out for himself on the plaster. Consequently, every fact differed, every part differed, and every ornament varied from the rest. As regarded the origin of some of the ornament, there was no doubt that the influence of the Byzantine work from the North had crept down. It would be of the greatest value to India in the future if they knew how to turn to account the resources of their local talent, and in that respect it seemed that Mr. Chisholm had done admirably in getting all the assistance he could from the vernacular and traditional work of the country.

General St. CLAIR WILKINS, R.E., in seconding the vote of thanks, said he had always admired Mr. Chisholm's designs which he had seen in India, and the description given of the Baroda Palace was most interesting. Major Mant, with whom he had been well acquainted, had asked him (the speaker) to criticise the plans after five minutes' inspection one day. He replied that it was rather a large subject, and the only thing he could suggest was that the tower was not calculated to stand. This remark led Major Mant to investigate thoroughly the subject of the foundations and strength of his tower, and Mr. Chisholm's conclusions in this respect were, no doubt, sound. Mr. Chisholm's position in being called in to complete this palace was a very pleasant one indeed for him. He could not imagine anything nicer than to have another man's plans before one, with perfect liberty to alter them as one liked, and with a very large treasury to draw upon. He gathered from Mr. Chisholm's Paper that the building was faced with sandstone, and of course the expense was very great; it could not fail to be expensive on account of the immense amount of ornament distributed over it. The ancient buildings in India in the Hindoo-Saracenic style were chiefly in stone. In those days there were no estimates, and therefore they were enabled to gratify their tastes in producing the most wonderful structures to be seen in any part of the world. Mr. Chisholm had done very well indeed in the alterations he had made, and had certainly done full justice to Major Mant, whom, he might say, he represented on that occasion, having been connected with him for many years in India. The Hindoo-Saracenic style was one extremely difficult for architects of the present day to indulge in on account of the enormous expense; in fact, the natives themselves frequently gave a stucco facing to their buildings. He did not know how the dome was constructed by Mr. Chisholm, but he was very well acquainted with domes in India. With regard to the dome of the Gol Gumaz at Bijapur, it was of most wonderful construction—of a kind, he believed, not to be met with anywhere else in the world. It covered a square area of nearly nineteen thousand feet, and there were no intermediate supports and no buttresses outside. The dome was nearly semi-circular, built of brick, and ten feet thick, the weight being hung inside. [The speaker explained the construction of the dome by diagrams chalked on the blackboard. A full description of the dome, with illustrations, will be found in a Paper by James Fergusson, "The Great Dome of Beeja-"pore," read before the Institute 27th November 1854.] The dome was built about 250 years ago, and he believed it was constructed on solid centerings, which were picked out afterwards. Of course, this represented an enormous mass of material, and to repair the dome would be a very large undertaking. Curiously enough, the dome had great cracks in it: the cracks appeared like the lobes of an orange, vertical all round, but it was still sound in other respects. Major Mant had built a very solid structure for the Raja of Kholapur in the Indian Saracenic style, but its cost was too high for a general adoption of the style. The improvement Mr. Chisholm had made in the design was very great, and he was sure that the friends of Major Mant would have been very pleased to have heard the Paper.

Mr. F. SILLS [*A.*] said that when in Calcutta he had been well acquainted with Major Mant, both privately and officially, and he had been very much interested in the Paper. The verandah was a source of difficulty in nearly all the public buildings he had had anything to do with in India. With regard to the Madras plaster, the columns in the Viceroy's palace in Calcutta were done in that way, and appeared as if they were marble. He would like to add as to painting that the workmen used a piece of rag; and though one might tell them to use paint-brushes, the moment one's back was turned, the paint-brushes were put down and the rag brought out again.

Professor AITCHISON [*F.*], A.R.A., in reference to the remarks on painting, said he fancied that the chances of artistic work were 100 to 1 in favour of the Indian painters as compared with any who came from England. He had not the least doubt that the native who put on his colour

with a rag produced a much better effect than the most skilful English workman could with a brush, for it would vary in tone like a piece of Nature's work instead of being flat. The natives of India had always been famous for their mastery of colour, and from India the world had probably learnt its lessons in colour. It was supposed that the Venetian colourists owed their knowledge and taste for colour to their intercourse with the East, and to the lovely fabrics that were made there. He had noticed that buckles and clasps, and women's jewels, made for natives themselves, were generally very fine; but anything done for the English market was of the vilest and most abominable description. The jewellery designed there for the English was in the most execrable taste; the twopenny twist of the baker's shop was, generally speaking, the Englishman's ideal of perfection, and if made in the Punjab was damascened with patterns tastefully designed and beautifully executed. The native pottery—in fact, anything the Indian touched—was most beautiful, having points peculiar to Oriental art. As far as the construction of the domes was concerned, it would be interesting to hear from Mr. Chisholm some account of those he had seen built by the natives. He had heard from travellers that many of the domes in Persia were built by rule of thumb on mounds of earth; if the dome fell, and any one was killed, the architect went away into a neighbouring province; but if it stood, he expected to be adequately rewarded for his work. M. Choisy had shown in his book, *The Art of Building among the Byzantines*,* the methods hit upon by which centering could be done away with; and no doubt such methods were still employed in the East. When Mr. Chisholm spoke of 2½ tons being put on a foundation the speaker did not quite catch whether he meant that was on the soil or on the footing. Very much, of course, depended on that. Again, as to style they must go to India, Burma, or Siam, to learn a living style of architecture. The English had none of their own. The most brilliant of English architects who went out to those countries were immediately captured by the native styles. There they had a living style, whereas at home there was little but a dead one, though this was being cured. He hoped that the young architects would endeavour to follow those studies which would enable them to mould their art on what had gone before, and turn the ordinary shapes required for construction into beauty—a beauty that would be appreciated by their own people in their own time. With regard to the great hall, he would suggest as a possibility that the idea of Durbar Halls was taken from the great Throne-rooms of the Imperial Palaces of Rome. The Indians visiting the Courts of the Roman Emperors, and seeing how the great men in the Western world were received, conceived that the same thing might very happily be used in their own country. With regard to the verandah, there was one building in Europe where, one might say, the whole of the interior of the building was a verandah, and that was the Alhambra. Although the heat there was not comparable to the heat of India, still it was hot. Round all the Courts there were cloisters on slender marble columns and arches, on which a lattice-work of tiles was erected, and then plastered into those curious arabesque forms that they had all admired and wondered at. There the object evidently was to get a thorough current of air through the place. He was not so sure, as some appeared to be, as to the variety that the Indian plasterer would give to different patterns. A water-colour artist went to India shortly after the Mutiny. Being in the Punjab, he happened to take refuge during a rain-storm in a building whose ceiling was newly plastered. While he was there a man came in with two or three laths. In the building was an old tub. The native got on the tub, and measured with a lath across the length and width of the ceiling, and put certain points in it. He then began to carve, with a broken end of lath, a most elaborate pattern. This artist was perfectly astounded at the excellence with which the native worked straight off. He stayed the whole day while the native finished the ceiling. The artist had an interpreter with him, to whom he said, "This is one of the cleverest men "I have ever seen in my life." The interpreter said, "Oh, no; he is rather a fool." The artist replied, "Well, I don't know what you may call "him, but I know I have been thirty or forty "years doing work, and yet I could not sit down "and do an elaborate thing like that without con-"sidering it beforehand and making several "alterations." "Well," said the interpreter, "this man's father had three sons, and he him-"self could do eight patterns. The eldest son "could do five patterns, the next son could do "four, but this chap, the stupidest of the family, "can only do two." His whole skill consisted in being able to work those two patterns that he had learned traditionally from his father.

MR. THOMAS BLASHILL [*F.*] said he only knew Indian architecture by drawings, and therefore he was not in a position to say anything about it; but, looking at such modern work as he had seen, it seemed to him to be losing, to a certain extent, that agreeable character which the old Indian architecture possessed. He had been much interested in what Mr. Chisholm had said about the verandahs. Instead of looking on the verandah as a temporary expedient, was it not possible to make more of it, and construct the buildings

* A publisher observed that to publish English translations of M. Choisy's works on *The Art of Building among the Romans and Byzantines* would be a financial disaster, as so few English architects read anything that could not be at once turned to practical use.—G. A.

almost wholly, as regarded their external appearance, of the verandah? He did not think that architects should be afraid of people imagining that a building had no solid walls, because every one who knew anything about it knew that there must be a sort of wall at the back of it. He was always interested in seeing the woodwork of India. There might be an objection that in some parts of the country it would be liable to the attack of insects, although Mr. Chisholm had not said so. It must be liable, also, more or less, to the danger of fire. But the woodwork of India was most interesting; and so was the stonework, which in the matter of ornament imitated woodwork to a large extent. It was a pity that that class of design and construction was not more studied—not only for India, but for England also. Some remarkable specimens of Indian construction were to be seen at the Indian Museum, South Kensington. The wooden ceilings at the entrance to the museum displayed a beauty of design, a skill of workmanship, and altogether a satisfactory arrangement which they very seldom saw in any highly ornamental material in England. A good deal of work of that kind was also to be seen at the Indian Exhibition at Earl's Court. Mr. Chisholm had favoured them with Papers before, and he (the speaker) felt highly gratified in again hearing him in reference to his Indian work. With regard to the plan, he should have been glad if Mr. Chisholm had gone a little more into detail as to what the particular rooms were, and given them some idea as to the habits of the inmates and the domestic and family arrangements. The more he could have told them of these things the more they would have been interested. The plan seemed to be a very rational one. The part where the public only were admitted appeared something like the *atrium* of a Roman house. The Maharaja's apartments, and the distinct house for the Zenana, looked exceedingly well upon the plan.

THE CHAIRMAN observed that Mr. Chisholm had commenced his Paper by a kind of half-apology for introducing a subject which was not European. They could assure Mr. Chisholm, however, that their sympathies were not only with his good work, but with every architecture under the sun—not only that which had been, but also that which they hoped would be. Few architects were fortunate enough to get clients who would give them palaces to build. But architects were creatures of imagination; they lived, as it were, in marble palaces. They did not get them to build, but they had them in their imagination, which perhaps sweetened and softened the worries of daily life. There were many interesting points in Mr. Chisholm's Paper, and one alluded to more than once, in which they had all a common interest—he referred to the adaptation of a verandah for domestic purposes. The verandah was largely used in India and in all Eastern countries, but he could not help thinking that it was not used to the extent it might be in England. It was true the climate of England was a variable one. But, at the same time, there were many months in the year when one could enjoy a semi-outdoor life, and if architects would pay more attention to the use of the verandah he thought it would be advantageous. He did not mean a verandah three or four feet wide, but a verandah of some width. It was virtually a room, which could be added at little expense. Another interesting matter was Mr. Chisholm's allusion to the work of Colonel Jacob at Jeypore, and that of Mr. Harris at Gwalior. Students in England had had their attention constantly drawn to the admirable text-book published under the superintendence of Colonel Jacob. Those responsible for that excellent work might congratulate themselves that their labour was appreciated, and that great good had resulted from it.

MR. R. F. CHISHOLM [*F.*], in reply, observed that with regard to what Mr. Spiers had said about bringing the roof of the main building above the verandahs, so as to give the idea of a solid building behind, he did not think the expedient altogether answered in practice. It had been actually carried out in one or two buildings, and an observer experienced the feeling that a cage, so to speak, had been dropped over the building—a cage of verandahs. One desired to remove the cage and see the building behind more fully. At least those were the feelings he personally experienced. What, unfortunately, added emphasis was the treatment of the dormers, which were not always in keeping with the treatment of the verandahs, the want of harmony adding to the cage-like appearance. He thought the solid building might be brought forward, and over the light verandahs it would secure a more dignified appearance. This was done with good effect in the Doge's Palace in Venice, securing solidity above lightness—weight above lightness he believed Mr. Ruskin called it. With regard to domes, he had read a Paper at the Institute* on domical construction, and he did not think it necessary to go over that ground again. He might explain briefly that the lower part of the College dome was turned, exactly as General St. Clair Wilkins had demonstrated on the blackboard, by intersecting squares. Centres were made use of for the inner angles only, but none for the other pendentives. In the Paper referred to, he explained that he had adopted in a kind of way Wren's principle carried out in St. Paul's. Wren seemed to see at a glance that a cone tied properly at the foot was a perfectly stable structure. He constructed his cone, and rested the dome on it,

* "New College for the Gaekwar of Baroda, with Notes "on Style and Domical Construction in India" [TRANSACTIONS 1882-83, p. 141].

supporting it by a series of timbers between the cone of brickwork and the dome outside. That, he believed, was the true way to construct a dome, although exception might be taken to the use of timber. In the dome he constructed at the College at Baroda, he built a cone of low curvature and then turned the true dome outside that. On the plan were sixteen cross walls, between the two domes uniting them. That dome was tied in at the base by two courses of stone-breaking bond. The stones being dowelled and cramped together, as long as that ring tied the base the dome was stable. He might mention that it measured about seventy-five feet across, and the thickness of each ring of brickwork was only fifteen inches. It looked a little dreadful when one looked down during the construction, but it stood all right. [PROFESSOR AITCHISON asked how, when the sloping point was reached, the bricks were prevented falling off the inside.] There was nothing to prevent them from falling but the adhesion of the mortar. Rub each brick well in the mortar, and it would hold. Indeed, no cement was used, only common mortar. Where, as in the palace, he had stone to deal with, the problem was simple, because each course could be cramped and become a complete ring in itself. He adopted the same principle of employing sixteen lobes of walls in this case without the inner dome, which, in stonework, he thought unnecessary, and on these he turned the dome visible outside. It mattered not what form the external dome was, provided the lobes were sufficient and tied at the base. [MR. SPIERS inquired how the stones were put up, as they wanted something to support them temporarily.] They were hoisted from the inside, and put on ring by ring, both dowelled and cramped. With regard to the manner in which domes were constructed formerly, he was under the impression that they were built without centres. He thought this because he had found in ruined stone domes complete rings with dowels and cramps, showing that the builders thoroughly understood the value of the tied ring: as each ring closed it became stable, the eye growing smaller and smaller until it was eventually closed. He thought also that brickwork domes were worked without a centre. At Golconda were several domes: the oldest were graceful externally and internally. But in two comparatively modern domes, built about seventy or eighty years ago, the inside domes went up in a feeble way, the curves turned in until they came to a point where the builders apparently hesitated to go further; so they solved the difficulty by putting timbers across and erecting trusses which they had left there, being afraid, apparently, to remove them. There were no lights or apertures. From the above facts he was under the impression that the older builders understood the method of turning domes without centres. The new builders, on the other hand, working on tradition, also without a centre, corbelled over feebly on the inside, keeping the outer form of the curvature right, but hesitating with the inside until fear of the material falling in deterred them from going further. The size of these domes was between 40 and 50 feet. He did not think any one had actually measured them. The stability of the large dome which General St. Clair Wilkins had alluded to was due solely, he thought, to the thickness. It was such an enormous thickness that the lines of pressure came well within the intrados. [MR. SPIERS asked if there was any reason to suppose that the bulbous nature of the dome was due also to the desire to hang weight outside.] He had thought of that point himself, but there was nothing to prove that the bulbous form had so originated. It was a mistake to imagine that the dome came into India through Persia. With regard to the pressure on the foundations, a very elaborate series of experiments had been made in Calcutta. As many of the public buildings of that city showed weakness of foundations, experiments were carried out, and these showed conclusively that it was not safe to put greater pressure than a ton and a quarter on alluvial earth, and that anything over a ton and a quarter was nearly certain to settle. In fact, it would seem to be better if it could possibly be so arranged not to exceed a ton per superficial foot of actual area at the base of the concrete. The soil was alluvial and very treacherous. The danger did not lie near the surface of the earth, but deep down, some fifty or sixty feet below the foundations. A very dry season would cause the earth to shrink; a wet season succeeded, and the earth raised its back up again, swollen from the water. No doubt it would have been much better if the Baroda Palace had been founded on wells. Piles were not much used in India. With regard to wood being attacked by insects, no teakwood was ever so attacked. It lasted sound for very many years. In the matter of Indian ornament, it was astonishing what an immense amount of capital the Eastern ornamentist would make out of one form. The variety at first sight seemed to be very great, but when dissected one or two parent forms produced the whole. That was not recognised at first, because the forms were so elaborately involved. One parent form, for instance, was a battlement upside down, and it was remarkable what that form ran to.

*** The exhibits referred to in the Paper included—Elevations of the palace as designed, and of the same as finished; photographs of the interior and exterior; a general view and sketch-plans of the old Palace of Dattia; an oil sketch of the interior of the Durbar Hall, and three etchings of the interior; a selection of the actual working drawings, and of casts from which the ornament was made; and plans of the basement, first floor, and second floor.

9, Conduit Street, London, W., 21*st May* 1896.

# CHRONICLE.

## THE HOLBORN-STRAND IMPROVEMENT.

**Scheme suggested by the Art Standing Committee.**

In compliance with the requisition of the Business Meeting of the 4th inst., the Report of the Art Standing Committee upon their alternative scheme for the new thoroughfare between Holborn and the Strand, together with the illustrative Plan, as submitted for the consideration of the London County Council, is here given :—

9, Conduit Street, W.: 15th January 1896.

*To the Improvements Committee of the Council of the Administrative County of London,*

HOLBORN TO THE STRAND IMPROVEMENT.

Gentlemen,—In view of the great architectural importance of this improvement, the Council of the Royal Institute of British Architects have carefully considered the proposals that have been made to you with respect to the proposed new thoroughfare between Holborn and the Strand, as set forth in your report to your Council of the 25th September 1895, and published in the Minutes of your Council, and have authorised us to submit for your consideration the following report.

As the Art Standing Committee of the Royal Institute of British Architects, we desire to convey to you our gratification with the evident consideration that the scheme has received from an architectural point of view, and for your expressed desire to retain the church of St. Mary-le-Strand.

We entirely concur in your choice of Plan A from those submitted for your consideration, but we are anxious to draw your attention to the following points :—

(1) *Width of Street.*—The proposed reduction in the width of the street to 90 feet is to be regretted, and we would venture to urge that at least the width of 100 feet originally contemplated be restored, though 120 feet would be preferable.

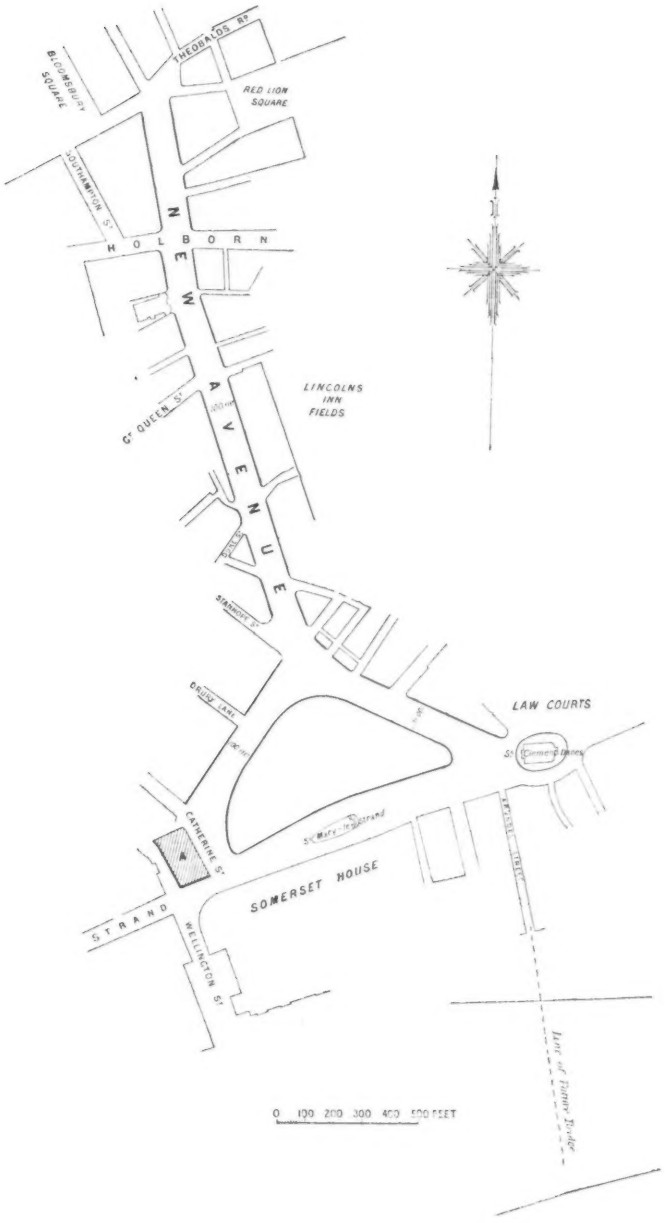
(2) *Architectural Termination.*—The very important question of an effective termination to the view southward from Holborn has already had your attention. The two existing buildings available as architectural terminations are the church of St. Mary-le-Strand and Somerset House. It is very doubtful, however, whether the side view of the church will form the effective termination desired ; this church having been designed for its effect when seen from the west, and the plan of the spire being an oblong, its appearance from the north will be thin and unsatisfactory. The spire would not be central with the new street, and, moreover, the church, being below the general level of the new street, will not present a pleasing effect. Somerset House, though open to the same objection as to levels, would present a better architectural termination ; but this would so change the position of the new street as to render the western spur awkward and steep, while the main street would acquire a westerly direction which would not be convenient for traffic to and from the City.

(3) *New Bridge across the Thames.*—The report suggests a possible further extension of the street across the river, but it is not indicated whether the suggested bridge is to be in a direct line with the new street or from one of the spur streets. If the former alternative is contemplated, the construction of a new bridge so close to Waterloo Bridge would gravely injure the view of one of the most beautiful bridges London possesses. On the other hand, the contemplated width of the spur streets seems inadequate for the traffic north and south that would follow the construction of a new bridge.

(4) *Traffic.*—It is not clear what traffic is expected in that portion of the new avenue between the Strand and the junction with the two spur streets. The use of this portion of the avenue appears to be limited to persons desiring to visit houses in the Strand between Wellington Street and St. Clement Danes Church. It would seem that traffic from the north desiring to go eastwards will use the eastern spur street, and that going westward the western spur street, while the through north and south traffic will seek for either Waterloo or Blackfriars Bridge by means of one of the spur streets.

(5) *Site for County Hall.*—It is important that if any site be desired for the erection of a county hall for London it should be adequate in size ; but, as a matter of fact, neither of the sites referred to in the report can be so regarded. Since the erection of the new Hôtel de Ville at Paris the growth of the municipal work has already rendered it necessary for portions of the Municipal Department to be transferred to barracks across the road, and even now considerable inconvenience is caused from overcrowding.

Having regard, therefore, to the above considerations, we have prepared a Plan which preserves the essential features of the Committee's Plan A, but modifies it in the following particulars :—




THE ART STANDING COMMITTEE'S PLAN FOR THE HOLBORN-STRAND IMPROVEMENT.

(1) The portion of the avenue between the spur streets and the Strand is omitted.

(2) The avenue is restored to 100 feet in width.

(3) The spur streets are each increased to the same width.

(4) The position of any future bridge that might be required is shown opposite the end of the eastern spur street.

(5) The whole of the triangular space between the Strand and the two spur streets would form an adequate site for the county hall, which could then be designed to form an architectural termination to the new avenue, with space for future extension. The county hall would thus occupy one of the most central positions in London, and the architectural effect of this pile of buildings, regarded in concert with the Law Courts, the flanking garden, and the two churches, would form one of the finest street views obtained in London.

In submitting this proposal we would point out that no difficulties as to gradient can arise, and that the cost should not differ materially from Plan A, while the scheme will be of a monumental character, reflecting great credit upon the Council.

We have felt that to do full justice to the occasion the western spur street should terminate in a square, or place, at its junction with the Strand and Wellington Street; but doubtless the great expense involved in this proposal has decided your Committee to abandon its obvious advantages.

We are, yours obediently,

(Signed) ALFRED WATERHOUSE, R.A.,
*Chairman, Art Standing Committee.*

(Signed) ED. W. MOUNTFORD,
*Hon. Secretary, Art Standing Committee.*

### Election of Candidates for Membership.

At the General Meeting of the 18th inst., prior to the announcement of the names of candidates recommended by the Council for election at the Business Meeting of the 8th prox., the Chairman made the following statement:—I have to announce that a number of gentlemen are candidates for Fellowship of the Institute, and that, in accordance with custom, the names would have appeared on the walls this evening as admitted to candidature. But the Council are of opinion that, as a Special Committee is now considering the whole question relating to the candidature and election of Fellows, it is desirable to postpone further proceedings in this matter till the Committee have made their Report. The Council have every reason to believe that the Report will be ready before the Business Meeting to be held on the 8th June.

### The Meeting and Dinner at Manchester.

The reception held prior to the Annual Dinner yesterday afternoon at the City Art Gallery, Manchester, was well attended, many members of the Institute having travelled from London and other parts of the country especially to attend both functions. Mr. Alex. Graham, F.S.A., *Vice-President*, took the Chair, in the absence of the President, Mr. Penrose, who had unfortunately missed his train, and arrived too late to attend the afternoon meeting. Mr. Edward Salomons [*F.*] read a Paper on "The Relations of the Institute to the Allied Societies," and an interesting discussion ensued, in which the following gentlemen took part:—Mr. John Holden [*F.*], President of the Manchester Society; Mr. Thomas Drew [*F.*], R.H.A., President of the Royal Institute of Ireland; Mr. Alfred Culshaw [*F.*]; Mr. George Bradbury, President of the Liverpool Society; Mr. John Slater [*F.*]; Mr. Edwin T. Hall [*F.*]; Mr. Alfred Waterhouse [*F.*], R.A.; Mr. R. Knill Freeman [*F.*]; Mr. Charles Fowler [*F.*]; Mr. W. Goldthorpe, Chairman of the Salford Hundred Quarter Sessions; and Mr. P. Gordon Smith [*F.*]. A cordial vote of thanks to Mr. Salomons and to the Chairman concluded the afternoon's proceedings.

### The late Arthur Billing [*F.*].

Mr. Arthur Billing, a Fellow of the Institute since 1863, died at his residence at Fulham on the 13th ult. He was born at Reading in 1824, and was the son of Mr. Richard Billing, a surveyor, and sometime Mayor of Reading. He was educated at the Reading Grammar School, and in 1845 came to London and entered the office of Mr. Benj. Ferrey, and afterwards that of Mr. Hardwick. In 1849 he commenced practice on his own account, and took offices in Beaufort Buildings, Strand, afterwards removing to Buckingham Street, Strand. In 1860 he entered into partnership with Mr. A. S. Newman, of Tooley Street, under the title of Newman & Billing. On the death of Mr. Newman in 1873 he was appointed Surveyor to Guy's Hospital, and also Surveyor to the St. Olave's District Board of Works, Southwark. In 1890 he took his eldest son, Mr. A. E. Billing, into partnership, and in 1893 Mr. J. W. Rowley joined the firm, which then took the title of Arthur Billing, Son, & Rowley. Among the numerous works upon which he was engaged may be mentioned several important additions to Guy's Hospital, such as the new large operating theatre, the post-mortem room and dead-house, the coroner's court, and various large class-rooms for the medical school, and houses in St. Thomas' Street for the medical staff, &c. Numerous wharves and warehouses in the City were erected by him, and several churches in various parts of London, among the latter being the Parish Church, Kidmore End; All Saints', Hatcham; Holy Trinity, Penge; St. Peter's, Eltham Road, Lee; St. John's, Chelsea; St. Augustine's, Stepney; and St. Peter's, Fulham. He also erected the Parish Church,

Hammerwich, near Lichfield; and the Meyringen Church (English), Switzerland. He carried out numerous restorations and enlargements in various parts of the kingdom, including St. Dunstan's, Stepney, Middlesex; Dingley, Stanford, Berks; Garvestone, Norfolk; Caversham, Oxon.; St. Magnus', London Bridge; St. Sepulchre's, Holborn; St. Margaret's, Ridge, near St. Albans; St. Michael's, Herne Hill; St. Mary's, Finchley; Seddlescombe, Sussex; St. Lawrence, Reading; Wrotham, Kent; St. Peter-le-Poor, Broad Street, City; and St. John's, Kensal Green. Other of his buildings are the Westbourne Hall and Bayswater Athenæum; the swimming bath for Christ's College, Finchley; and the new Branch Library, Wandsworth Bridge Road.

### Additions to the Library.

The Institute is indebted to Mr. Harry Sirr [*A.*] for the following books:—*A Glimpse at the Monumental Architecture and Sculpture of Great Britain from the Earliest Period to the Eighteenth Century*, by Matthew Holbeche Bloxam [8o. Lond. 1834]; *Practical Essays on Various Branches of the Fine Arts*, to which is added a Critical Inquiry into the Principles and Practice of the late Sir David Wilkie, by John Burnet, F.R.S. [8o. Lond. 1848]; *A Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful*, with an Introductory Discussion concerning Taste, &c. [8o. Lond. 1787]; *Criticisms on Art*, by William Hazlitt, with Catalogues of the Principal Picture Galleries of England [8o. Lond. 1844]; *Essays on Gothic Architecture*, illustrated with twelve Plates of Ornaments selected from Ancient Buildings, by Rev. T. Warton, Rev. J. Bentham, Captain Grose, and Rev. J. Milner [8o. Lond. 1802]; and *An Architectural Tour in Normandy*, with some Remarks on Norman Architecture, by Henry Gally Knight [8o. Lond. 1836]. The two last-named works Mr. Sirr has presented to the Loan Library, the others to the Reference Library.

The author, Mr. John Cotton [*F.*], has presented a pamphlet entitled *Thoughts on Architectural Progress*, being a Paper read at a combined meeting of the Midland Arts Club and the Architectural Association, Birmingham, on the 14th ult. [Birmingham: Cornish Bros.].

The following have been received from their respective Societies:—*Archæologia*, vol. liv.; *Scientific Proceedings*, vol. viii. parts 3 and 4, and *Scientific Transactions*, vol. vi. parts 1, 5–12 of the Royal Dublin Society; *Transactions* of the Surveyors' Institution, vol. xxviii. parts 8–10; *Transactions* of the North of England Institute of Mining and Mechanical Engineers, vol. xiv. part 5, vol. xv. parts 1 and 2, together with part 3 of the Report on Explosives; *Journal* of the Sanitary Institute, vol. xvii. part 1; *Memoirs and Proceedings* of the Manchester Literary and Philosophical Society, 4th series, vol. x. No. 1; *Occasional Papers* of the Royal Engineers' Institute, Chatham, vol. xxi., and *Papers* 1 and 2 of vol. i.; *The A.A. Sketch-book*, 3rd series, vol. i. Nos. 11 and 12; *L'Emulation*, 1895, No. 11, from the Société Centrale d'Architecture de Belgique; and *Bouwkundig Tijdschrift*, vol. xiv. part 1, from the Maatschappij tot Bevordering der Bouwkunst.

## REVIEWS. XLI.

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### A NEW HISTORY OF ARCHITECTURE.

*A History of Architecture for the Student, Craftsman, and Amateur: being a Comparative View of the Historical Styles from the Earliest Period. By Banister Fletcher, F.R.I.B.A., Professor of Architecture in King's College, London, Fellow of King's College, London; and Banister F. Fletcher, A.R.I.B.A., Instructor in the Architectural Studio, King's College, London, &c. With 115 plates, mostly collotypes, and other illustrations in the text. 8o. Lond. 1896. Price 10s. net, post free. [B. T. Batsford, 94, High Holborn.]*

The authors explain in their preface that their aim has been "not only to give in clear and brief "form the characteristic features of the architec- "ture of each people and country, but also to "consider those influences which have contributed "to the formation of each special style." The first part of their task they carry out in each case by what they rightly call "brief but . . . "vivid notes of the special qualities and charac- "teristics of the building referred to," and for the latter they provide by means of paragraphs under the headings "Geography," "Religion," "Social and Political," "Historical," and the like. In the former department they have succeeded admirably, especially in those parts of their subject where no profundity of analysis is required. The whole of the latter portion of the book, embracing the Renaissance and modern periods, is excellent. The authors have looked at the chief buildings of these later styles in various lands with practised and appreciative eyes, and note in a few pointed sentences their special characteristics and the features in which they resemble or contrast with each other. They seem here to be thoroughly at ease, and they make their readers feel at home in the different architectural centres they visit in their company. The student, craftsman, and amateur, for whom they write, will each feel in his own way grateful for the helpful instruction and pleasant companionship thus afforded to him.

In other parts of the subject, it must be confessed, the treatment seems hardly adequate to the themes. Where there is great historical or constructive interest involved, this easy, gossiping

style is too slight, and a far more searching analysis and greater mental concentration are needed than the authors have cared to apply. For example, the five pages of general introduction to the great subject of Romanesque architecture in Europe are poor, and neither the constructive nor the historical significance of early French Gothic architecture is adequately explained. The authors seem to have made a self-denying ordinance [Preface, p. vii.] to avoid technical descriptions; but this is, one may venture to think, in the present day a mistake. The intelligent general reader who opens an architectural book written by a well-known member of the profession looks to have a subject like Gothic construction properly explained to him, and is quite prepared to follow an analysis carefully without voting it dry. As the authors say truly [p. 153], "vaulting is one "of the most important features of the period. "Its development involved the solution of a group "of constructive necessities which influenced very "largely the course of the style itself"; yet they do not take pains to put the matter clearly and fully before the reader. When they do give a technical note it is not framed so as to carry information to the non-technical mind. It is useless to tell the layman, without further explanation, that [p. 153] "stellar vaulting converts "the ribs, once constructive, into rich decorative "patterns, and by its complications leads to a "system of forming the trunk of the vaults by "ribs of similar curvature. From this the change "to conoids is easy, which is the basis of fan-"vaulting. In such examples the ribs are mould-"ings sunk in a solid stone vault, which is a "return to the Roman method of vault building. "*Note* that where the conoid ribs are not pro-"duced the meeting of the same is effected "against a *flat* lozenge panel." The intelligent amateur needs to be informed what this Roman method was, and how the art of vaulting developed from this into the more complicated and scientific forms of the Mediæval period. The authors, however, seem to take but little interest in the subject, for they state [p. 104] that, in European Romanesque, "in early buildings rib mouldings were "used in the vaulting," whereas the significant fact of the period is that in early Romanesque buildings ribs were *not* used, and it was the introduction of ribs, somewhere about 1100, that gave the start to the whole after-development of vaulting.

Again, on the historical side, the class of readers we are considering would require something much more systematic than the scattered notices under the headings already referred to. A few pages explanatory of the position of the Christian bishops in the Romanised West, and of the monks and their life, might with advantage have been prefixed to the whole subject of Mediæval architecture in Europe, and have saved numerous jottings under the head "Religion" in the sections. As it is, we find [p. 133] (after an amazing statement that "by the thirteenth century "the greater part of Europe had embraced "Christianity") the Orders of monks noticed specially in connection with English architecture, for which there is no apparent reason, while on the other hand no explanation is offered of the really English peculiarity of the monastic character of so many of our cathedral establishments, which is the true ground of the characteristics mentioned on p. 140. The authors seem, indeed, to have the curious idea that the cloister attached to so many English cathedrals was a survival of the early Christian "atrium" [p. 83]. It is really a relic of the monastic system, and its appearance in England and not on the Continent is worth explanation.

It is to be feared that the method in which the book is arranged, though attractive at first sight, is open to serious objection in practice. By splitting the subject up into so many small divisions the opportunity is lost for those general discussions of points of real moment without which a book of this kind seems lacking in due weight and dignity. At all the periods there is a temptation to say something under each of the various headings, though under some of them there may be really nothing of point to bring forward. There are only certain social, political, and religious facts that really bear on architecture, and the same may be said about the facts of geography, climate, and geology. These should be brought out as clearly and fully as possible; but it is inadvisable to fill up valuable space with miscellaneous information without any essential connection with the subjects in hand. The room saved by omissions here might then be used for the well-thought-out demonstrations the want of which reduces so greatly the value of the volume.

After the case of the amateur reader we may take that of the student, for the modern "Crafts-"man" is a person of such special views that it would be difficult to cater for him aright. Students—by whom we mean primarily those who are working for the Institute Examinations—form an important class among the probable readers of the volume, and it is in their interest that the book is subjected to a somewhat close examination. A book for students should be scientific in its method, and, above all, accurate in statement. If one has to say that the volume under notice too often fails in these respects, it is not from any wish to cavil, but from a feeling of regret that a work marked by so many excellences should be marred by errors which greatly take from its possible usefulness to learners. Many of the errors are merely slips (though they are none the less to be deplored): thus "B.C." is put for "A.D." on pp. 39, 59;

"Kent" for "Hampshire" on p. 60; "vertical" for "horizontal" on p. 301; "lower" for "upper" on p. 95; "Adams" for "Adam," pp. 283, 285. Again, "Adams, Spalatro and Works of the "Brothers Adam" is given as a title of a reference book on p. 284; the Baptistery at Nocera is wrongly called "St. Agnese" on p. 85; the Great Pyramid is stated to have been faced with granite [p. 12], whereas the material was limestone. One may note also that brick was not used at Rome "in bulk for walling" [p. 51], but only, as Professor Middleton has been at pains to show, for facing purposes. It is not the case that the older Doric columns have no entasis [p. 40]. Corinth is exceptional in this, and the entasis in most old examples is specially marked. The Byzantine dome cut from the half orange [p. 98] is only one kind of Byzantine dome. In the example specially referred to, that of St. Sophia, as well as in other important instances, the dome is not part of the same sphere as the pendentives, but rises independently from the summit of these. The Byzantine cap is explained on p. 98 by reference to an illustration which shows two quite distinct shapes, while a different one again seems to be described in the text—for the "deep abacus or "block" is something quite distinct from the normal abacus, as shown in the illustration. The interesting subject of Romanesque caps has scanty justice done to it by the statement on p. 104 that "the capital in early times is of a cubiform shape." The cubiform cap in the West, at any rate, does not come into use till the Middle Ages are far advanced, while forms of the Corinthian and Ionic caps appear earlier, and are equally abundant throughout the style. It is hardly the case that "St. Sophia has been the model for all Byzan-"tine churches up to the present day" [p. 94]. And why should the tomb of Galla Placidia be called Byzantine [p. 94]?

In the case of the Pantheon [p. 57] the authors have taken due account of recent discoveries, but they ignore the fact that the discoveries of Mr. Penrose have proved the Temple of Olympian Zeus at Athens to have been octastyle, and they give its plan on their Plate 18 as decastyle. (The Temple is not Roman [p. 56], but was substantially the work of Antiochus, as Vitruvius makes clear to all readers of his now neglected treatise.) The old traditional date of St. Mark's at Venice, 977–1071, is still retained in spite of recent discoveries. Sundry dates of Greek temples need revision. The time-honoured theory that the early Christians "adapted the ancient basilicas . . . for their own "places of worship" meets us on p. 81; but it is rather too much to read, as proof of this: "How "suitable the Roman basilica was for Christian "worship is easily seen from the plan of the well-"preserved example of San Clemente at Rome"—for San Clemente is a building of the eleventh century. Another survival is the theory (a legacy of Fergusson) that Assyrian architecture was columnar [p. 1]. It seems hardly worth while recommending books of reference like Perrot and Chipiez' *Assyria* if their teaching is ignored in the text. One of the most fundamental facts in the general history of architecture is the development of brick construction in the Mesopotamian valley, with the consequent evolution of the arch and vault, which played a part in the later Greek or Hellenistic world as well as in that of Rome. There is a relic of the old mysticism of pre-Flinders-Petrie days in the statement about the Great Pyramid, that "if the pyramid had been "left at half its height, it would have remained a "national observatory; but as it was closed over, "its object was astrological" [p. 9]. Elsewhere the authors rightly envisage the pyramids as simply royal tombs.

As was said above, the object with which these criticisms have been offered has been to point out how an interesting and valuable book might without much difficulty be substantially improved. There is so obviously a place for an English book on architectural history more compact in size than "Fergusson" that we may expect a second edition of the volume to be before long called for. Some judicious excisions and additions, for which there would then be an opportunity, with careful correction throughout, would make a very different thing of it from what it is at present. The glossary at the end should be improved, or omitted.

*Edinburgh.* G. BALDWIN BROWN.

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## THE RUSKIN MUSEUM, SHEFFIELD.

*The Principles of Art as illustrated by Examples in the Ruskin Museum at Sheffield: with Passages, by permission, from the Writings of John Ruskin. Compiled by William White. Demy 8o. Lond.* 1895. *Price* 10s. 6d. *net.* [*George Allen, 156, Charing Cross Road.*]

It is hard to place this book in any recognised category. Primarily, it is an inflated catalogue, but it has a special character of its own, because the collection with which it deals is a connected one, built up by a single man to illustrate certain principles of Art. As a piece of literary work it is a mere mosaic; the tesseræ, which we need not stop to appraise, are Professor Ruskin's; the setting is supplied by Mr. W. White, who may be complimented on the fulfilment of an arduous task. That it was a labour of love is abundantly evident, but one may perhaps be permitted to regret that the writer has not stopped at times to add a dash of bitter to the somewhat honeyed adulation with which master and disciples are alike served up. Everything, we are to understand, is for the best in the best of all possible coteries, and the reader must make haste to join it, if he craves an unalloyed appreciation of these pages.

We have yet a bone to pick with Mr. White, and we should not have looked for the particular

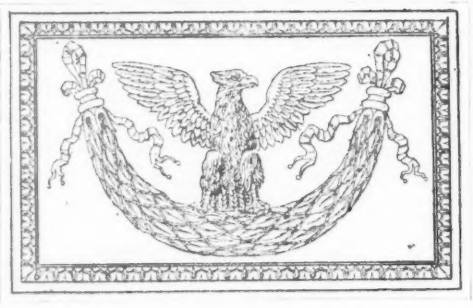
shortcoming in the pupil of so great a master of English prose, but the truth is that the English is decidedly slipshod. What are we to make of this, for instance? "His" [the possessive pronoun refers to Perugino, whose name has not been mentioned for twenty-three lines!] "early "instruction in Art appears to have been derived "from a pupil of Benozzo Gozzoli—Fiorenzo di "Lorenzo by name—but as he was only a few "years Pietro's elder, his influence, whatever his "powers, could have been but slight during the "short period he was with him, especially as it "is known that in his younger days, when he "suffered much poverty and privation, he also "acted as an assistant to Piero della Francesca, at "Arezzo." And yet one used to look on Greek choruses as wanting some unravelling! This jewel does not stand by any means alone, nor does the divided infinitive fail to rear its venomous head; but, after all, these blemishes do not affect the book in any way vitally.

As regards the matter, it does not do to accept everything quite unquestioned: on page 206, for example, the compiler speaks of the subjects of Holbein's "Ambassadors," so called, in the National Gallery, as being still unknown. This ceased to be true several months back—possibly after publication.

Two pages on we are told that it is still questioned whether the Darmstadt or the Dresden "Meyer Madonna" of the same painter is the original, and it is further stated that the latter is regarded by some as a replica by Holbein himself of the earlier picture. Now I believe that all painters have long since agreed, not only that the Darmstadt picture is the original, but that the great painter's touch is conspicuously absent from the latter. The mere amateur may, however, and probably will, continue to prefer the copy.

Yet two pages further on we read: "The tardy "recognition of Sir Edward Burne-Jones's ex-"ceptional art-power by the honour of Baronetcy "(*sic*) recently conferred on him is of consider-"able historic interest." It may be that Sir Edward Burne-Jones is "our only artist," as Professor Ruskin has said. A Celt by race he is at least our most distinctively *English* artist, but to complain that recognition of his work has come late is somewhat absurd. The rare honour—rare among artists at least—of *a* Baronetcy, coupled with election as an Associate of the Royal Academy under circumstances at once exceptional and flattering, are no mean official recognition, nor so utterly belated, of a worth the appreciation of which among art-lovers has long been raised to the dignity of a cult.

If, then, some of the good things are, as it seems, difficult of digestion, he who picks his sugarplums with discretion and refuses to trust too confidingly in specious appearances may yet feast royally. A. E. STREET.



## AMERICAN EDUCATION.

By PAUL WATERHOUSE [*F.*], M.A.Oxon.

As a place of residence for high thinkers the universe would be improved by the suppression of facts. Facts are the inconvenient shoals that beset the channel of the theorist's voyage. And, after all, it is for the philosophic navigator to decide whether, if they keep under water, he is bound to recognise every rock that specks his chart. In the interests of easy sailing may you not sometimes ignore even those which grate warningly upon your keel if you can only manage to pass over them on a well-chosen tide?

Perhaps there is no more tempting field for theory than the subject of architectural education, and none in which the facts are more disastrously distributed. In this region these facts take the form known to all of us: of architects successful in all senses—often artistic in the best senses—whose past training and whose present intellectual equipment are together a blasting contradiction of all one's most cherished theories of how to educate an architect, and what he should be when educated. As facts we must ignore these gentlemen, and cling to the higher truths they contravene.

In America they have not given up thinking on the education question. Without, perhaps, going into the wider questions of general culture, they at least take a large and logical view of the nature of technical training. When I say "they" it would perhaps be fairer to say Professor Ware, of Columbia College, New York. He, at least, is no one-eyed specialist, but a sound thinker and an accomplished writer. Thirty years ago he was the pioneer in the States of this educational question, and it was not long before he came to a conclusion that, instead of looking to England for a model in this matter, America would be wise to set up her own standard as a sample to the world. Two pamphlets,* written some years ago and recently forwarded to our Library, give us a

* "The Instruction in Architecture at the School of "Mines," by Professor William R. Ware, reprinted from the *School of Mines Quarterly*, November 1888. "The "Study of Architectural History at Columbia College," by the same author, *ibid.*, No. 1, Vol. xvii.

notion of the form which that American standard has taken. These pamphlets merit perusal and study. Once and for all they should silence any outcry against instruction, and even examination, in design; moreover, they make manifest the degree to which a teacher can go in the application of first principles to the historical study of architecture. To many, I am sure, the Professor's statements will come as a revelation and a pregnant suggestion. Any thoughtful reader will recognise in them a system the simplicity of which is as astonishing as its comprehensiveness. I wish here to allude to three only of the methods described and advocated.

Two of them consist respectively of the practice of drawing from description and of the revival of ancient problems upon a modern drawing-board. The third system one could call "mutual instruc-" tion" were it not that the phrase has fallen on hard times, so that its significance is mislaid.

The "revived problem" is a device whereby the student not only gets a grip of one of those great riddles the answering of which constitutes architecture, but by the very grappling with the mysteries learns the inward and spiritual elements of those evolutions which a superficial student handles as mere history. Refer to the example given by Professor Ware, and you will see at once how history, for all that it is with architects but a means to an end, can be most profitably and digestibly absorbed by the very reasonable process of allowing the end to forerun the means.

"Design by anticipation" is the rather inapplicable name which Professor Ware has given to the process, and this is his illustration.

Starting as a datum from the comparatively simple construction of the ordinary quadripartite vault, a class of students had set before them the problem "of carrying a vaulted aisle round a "semicircular or polygonal apse." In two hours the variant brains of the class produced on various drawing-boards those five solutions of the problem which the craftsmen of the Middle Ages took two centuries to develop. Thus was a difficult piece of progressive archæology intimately studied and indelibly learnt.

Drawing from description—otherwise called design from dictation—has, one would think, even more fruitful results than those attributed to it by the Professor. That a building, or the features of a building, should be drawn from a verbal description with anything like accuracy is certainly a marvel, but it is as nothing compared with the greater marvel of the description itself. Imagine twelve English architects of to-day endeavouring to describe even so simple a thing as an Ionic capital. It is certain that ten of the dozen would fail. The art of rendering architecture in words has with us been hitherto uncultivated. To cultivate it is obviously to arrive at that logical analysis, that definition which goes hand in hand with the mere art of attaching names to things. Nomenclature, to be sure, is taught and is demanded in our examinations, but with a certain timidity, for it is branded as a Pharisaic burden bound by the Institute on the backs of young aspirants whose souls should be led to thirst for higher things. "What mortal good," says a caviller, "can it do a lad of twenty to know what "an *apophyge* is; and why should you ask him "for such knowledge?" The rejoinder should be that the youth who can answer half a dozen questions of definition has gone at least a little way into the rational anatomy of his art; if he can go further, and not only draw a piece of architecture but describe it—and for such a description a knowledge of technical language is essential—then he is certainly something more than a mere walker on the surface.

The methods of mutual assistance of which Professor Ware speaks are not altogether unlike systems of which we have had experience in London, but perhaps in America they have been prosecuted with more regularity and completeness. They have been based in some cases upon the foregoing principles of design from dictation and problem solution. The results of the students' labours on a particular subject are exchanged and mutually criticised; or descriptions written by students themselves are worked out by fellow-students, compared with the originals of the descriptions, and in turn subjected to criticism. Again, the possibilities of division of labour have not been overlooked; and when, for instance, it has been thought desirable, for the simultaneous acquisition of a foreign language and of foreign ideas in architecture, to read a foreign book, each student has been allotted a page to work up and construe in class, thus enlarging the span of one lesson's study without unduly stretching each individual's task of preparation.

Probably American architectural education has not been standing still since 1888, the date borne by one of these papers by Professor Ware, and it is very unlikely that its progress since that year has been downhill. It is therefore clear that we may do worse than look to the Americans for an example of rational method in education. Certainly we may miss an opportunity of international courtesy by omitting to thank Professor Ware for his initiation and his exposition of that method.

## NOTES, QUERIES, AND REPLIES.

**Saint-Front of Périgueux** [p. 409].

From R. Phené Spiers [*F.*], F.S.A.—

Professor Baldwin Brown seems to think that I had not given due consideration to the deliberate judgment of Herren Dehio and Bezold when I suggested that the idea of the extension of the domed church of Saint-Front westward "must

"have occurred to them long after they had "visited the building." It was only after a careful examination of their drawings that I came to this conclusion, and it seemed to me to be on the whole the fairest interpretation.

The plan and section which they give of Saint-Front is based, according to their own statement, on the drawings in Gailhabaud and De Verneilh and some measurements. I conclude, therefore, that they measured some portion of its structure as restored, and subsequently, on their return home, worked out their drawings. It is not likely that they could have worked out the drawings on the spot; the plan is too large to admit of that. Besides, it is not the custom with French or German architects to "measure and plot on the "spot," and it has only been done by English architects within the last thirty years, chiefly owing to the strong and continued advice of the late William Burges always to adopt this system. I can quite understand how the idea may have occurred to them when their plans were worked out; and the question remains, Did they return to examine the building in order to see whether their idea was probable or feasible? An examination of their drawings will, I think, prove that they did not; and, as I am virtually challenged to do so, I will give my reasons. In the four central piers the passage runs through in two directions, and is vaulted with a barrel-vault. As the passages are of the same width, and the barrel-vault of both has the same level of springing, the intersections come in two vertical planes, and are suggested in Herren Dehio and Bezold's plan by dotted lines. In the western piers, if there had been any intention of extending the church to the west, the barrel-vault would have run through from east to west, and the cross vault would have intersected on one side only. But in the south-west pier the contrary is the case: the barrel-vault runs from north to south, and the vault from the east side penetrates half through only. It was certainly, therefore, not intended to lengthen the church on the south side. On the north side, for some reason, the passage running from the east is wider than the others, and therefore, it appears, they thought it simpler to let the smaller vault, running from south to north, penetrate it. Neither of these penetrations, however, is shown in Herren Dehio and Bezold's plan, so that either they had failed to notice it, or they thought it safer to leave that on the south side out because it interfered with their proposed extension. I assumed the first interpretation as being the more charitable. There is, however, a third reason. They may have forgotten it, and I should have been willing to give them the benefit of the doubt if in other portions of their drawings I had found that strict observance of actual facts which should entitle the work to the high commendation which Professor Baldwin Brown gives to it. Confining my attention to *the Aquitainian domes*—the only illustrations which I have had time to analyse carefully—I regret to say that *they are most unreliable.* If there is any characteristic to which an architect attaches more value than to any other, it is in the correct jointing and the shape and size of the voussoirs of an arch; and here in Aquitaine it is of the greatest importance, because the voussoirs are of a more complicated form than is found in any other buildings, perhaps, in the world. Now the arches are not all quite of the same height even in the same dome. Thus, in the central dome the east and west arches have a keystone and thirty-seven voussoirs each side; in the north and south there are only thirty-six voussoirs plus the keystone. What are we to think, however, of the arches in Herren Dehio and Bezold's section, which shows *twenty-one voussoirs only, plus the keystone*? This is not the only error. The voussoirs of the upper part of the arch lean forward—so much so that in section the line of the extrados is parallel with the line of the intrados [see fig. 16]. (M. Lambert pointed out that my drawing No. 15 was in error, as I had made the projection slightly less at the top; and he assured me that in the ancient as well as in the restored building the lines of extrados and intrados were in section parallel.) *Herren Dehio and Bezold have made the keystone vertical.* If, after preparing their drawings, they had paid a second visit to compare them, would they have had the courage to publish them as they have shown? But these are not the only errors. In the jointing of their piers they show only twenty-seven courses; there are thirty-seven in the actual pier, and there were thirty-seven in the original pier before restoration. Similar mistakes occur in the drawings of Solignac, Saint-Etienne, Périgueux, and Cahors—all unrestored buildings; and these I have compared with photographs. I therefore think I was perfectly justified in my assumption that they had not examined the building after their drawings were made and their ideas evolved. Professor Baldwin Brown asks for proof that the west dome was the first built. I remembered that in the course of my conversation with M. Lambert he, speaking of the restoration, remarked that the west dome was the last restored, but the first built. However, to make sure, without informing him of Herren Dehio and Bezold's theory, I put two questions to M. Lambert: (1) Is there any evidence that it was intended to carry the domed church westward? (2) Which was the first dome built? He replied (1) that, both externally and internally, the west end of the domed church was completed as we find it, with no intention to carry it westward. (2) The monk's choir having been burnt down, the first work carried out was the west dome; and this, with its raised floor, was probably used for many years before the remainder

of the church was completed. M. Lambert has been the resident architect in the work for, I think he told me, twenty-seven years, so that it is not worth while going behind his evidence.

### The Flora of Ancient Buildings.

From JOHN HEBB [*F.*]—

Byron, in *Childe Harold* (canto iv. stanza 107), gives a very faithful description of a ruined building overgrown with weeds in wild profusion:—

> Cypress and ivy, weed and wall-flower, grown
> Matted and massed together, hillocks heaped
> On what were chambers, arch crushed, column strown
> In fragments, choked-up vaults and frescoes steeped
> In subterranean damps.

Some time ago Cavaliere Giacomo Boni [*Hon. Corr. M.*] proposed to cover the ruins of ancient buildings with a layer of earth sown with *Lippia repens*, *Carex*, and other flowering plants having shallow roots of a texture calculated to protect the walls beneath, and to relieve with a note of fresh and transparent colour the monotonous tone impressed by time on the walls of tufa, travertine, and laterizia of ancient Rome. This was only a first step, an attempt which gave rise to other studies and proposals comprised within the cycle of the general theme—the flora of ancient buildings. In a similar spirit the Theban invoked the ivy to climb slowly, slowly over the tomb of Sophocles, spreading its verdant sprays, as did also the flowers grown on the tomb of Anacreon which inspired Antipater:—

> Wind, gentle evergreen, to form a shade
> Around the tomb where Sophocles is laid.
> Sweet ivy, wind thy boughs; and intertwine
> With blushing roses and the clust'ring vine:
> Thus will thy lasting leaves with beauties hung
> Prove grateful emblems of the lays he sung.

Around the ruins of the Appian Way and the Via Latina flourish instead the hateful nettle and the insidious briar, as they did around the sepulchre of Archimedes at Syracuse until indignantly removed by Cicero. The nettle and the briar have supplanted the rose and the violet, the favourite flowers of the Roman Republic, as well as the lily, the flower-de-luce, and the amaranth, which are enumerated by Pliny in their order of flowering.

Cavaliere Boni proposes to add the Etruscan and Greek poppy, the anemone, the crocus, the orchis, the iris, and other wildflowers, such as the fern, broom, asphodel, heath, &c.; to encourage the growth of the dog-rose, ground-ivy, and honeysuckle on the ruins, and to plant upon them dwarf shrubs similar to those we see depicted with great care in the first century in the pictures of Ludius at the Villa Livia.

Myrtle, laurel, oleander, pine, cypress, oleaster, ash, maple, juniper, and crab-apple trees might be planted as far as Frattocchie in those places where the Appian is now bare and desolate. The traveller, finding himself sheltered from the heat by a laurel or a myrtle tree instead of the intrusive and evil-smelling ailanthus, the unclassical gleditchia, or the rusty berberis, would gladly recall the lines of the second eclogue of Virgil:—

> Et vos, o lauri, carpam, et te, proxima myrte:
> Sic positæ quoniam suaves miscetis odores.

There can be no reason why roses, lilies, and violets should not be planted about monuments constantly under supervision, such as the so-called Temple of Minerva Medica, the Baths of Caracalla, &c. Without wishing to convert the ruins of ancient buildings into cockney gardens, Cavaliere Boni proposes to replace ugly and noxious growths by beautiful plants beloved by the ancients, such as one might imagine were grown in the greenhouses of the houses at Pompeii, the floors of which are now covered with rubbish.

The Italian Minister of Agriculture, Signor Granturco, has received these proposals with favour, and one may heartily hope that Cavaliere Boni will succeed in carrying them into execution, with the co-operation, not only of the residents in Rome, but of the common friends of Roman remains of all nationalities.

## MINUTES. XIV.

At the Fourteenth General Meeting (Ordinary) of the Session, held Monday, 18th May 1896, at 8 p.m., Mr. Alex. Graham, F.S.A., *Vice-President*, in the Chair, with 10 Fellows (including 7 members of the Council), 8 Associates, and several visitors, the Minutes of the Meeting held 4th May 1896 [p. 411] were taken as read and signed as correct.

The Chairman announced that it had been considered desirable to postpone further proceedings in the matter of an intended election of Fellows until the Special Committee now considering the question of such elections had reported [p. 436].

The following candidates for membership, found to be eligible and qualified according to the Charter and By-laws, and admitted by the Council to candidature, were recommended for election, namely:—As ASSOCIATES: James McCurrey Cable, F.S.I. (*Qualified* 1895); George Macfie Poole (*Qualified* 1895) (Sydney, N.S.W.); Arthur Ernest McKewan (*Probationer* 1890, *Student* 1891, *Qualified* 1894) (Birmingham); Herbert Henry Dunn (*Qualified* 1895) (Lincoln); John Ford (*Qualified* 1895) (Devon); James Guthrie Henderson (*Qualified* 1895); James Greenwood Stephenson (*Qualified* 1894). As HON. ASSOCIATES: Arthur Thomas Walmisley, M.Inst.C.E.; Sir Benjamin Baker, K.C.M.G., F.R.S., LL.D., President of the Institution of Civil Engineers; Horatio Walter Lonsdale; T. Raffles Davison; Hay Frederick Donaldson, M.Inst.C.E.; James Andrew Strahan, M.A., LL.B., Barrister-at-Law.

A Paper by Mr. R. F. Chisholm [*F.*], F.M.U., entitled BARODA PALACE: THE TOWN RESIDENCE OF H.H. SIR SYAJI RAO, G.C.S.I., MAHARAJA SAHIB GAEKWAR, was read by the author, and, having been discussed, a Vote of Thanks was passed to him by acclamation.

The proceedings then terminated, and the Meeting separated at 10.15 P.M.

**Erratum.**—A slight error occurred in the report of Mr. Beresford Pite's remarks on the Grant to the Architectural Association at the Annual General Meeting [p. 420]. The

second sentence should read: "The Architectural Asso- "ciation has prepared practically 689 students during the "past five years for the Institute Examinations, counting "the yearly totals."

## ALLIED SOCIETIES.

### The Sheffield Society.

OFFICERS AND COUNCIL 1896–97.

President, Mr. C. Hadfield [*F.*]; Vice-President, Mr. R. W. Fowler; Treasurer, Mr. Frederick Fowler; Hon. Secretary, Mr. C. J. Innocent [*F.*]; Council, Messrs. W. C. Fenton, T. J. Flockton [*F.*], E. M. Gibbs [*F.*], W. F. Hemsoll, H. W. Lockwood, J. Smith, and T. Winder, Assoc.M.Inst.C.E.

## LEGAL.

### Public Building.

At the North London Police Court on 10th March the Hackney Board of Guardians were summoned, at the instance of Mr. Frederick Meeson, District Surveyor for East Hackney North, for using Nos. 24 and 25, Sidney Road, Homerton, as a public building—viz. as the married couples' quarters of the workhouse—the District Surveyor not having declared his approval of the construction of the said buildings.

Mr. Jutsum, solicitor, appeared for the District Surveyor; Mr. Ryde, barrister, was for the Guardians; and Mr. Chilvers watched the case for the London County Council.

Mr. Jutsum stated that the Hackney Board of Guardians had occasion to provide quarters for a number of aged married couples. The Board purchased two houses, adjoining the workhouse, in Sidney Road, Homerton. They made certain alterations, and caused the buildings to be occupied. Mr. Meeson served the Guardians with a notice, but the Guardians did nothing, and when Mr. Meeson visited the buildings in February 1896 he found the houses occupied by fourteen persons. The staircases were made of ordinary deal (quite unfit for a public building), the walls were only nine inches thick, and considerably bulged. The sole point which arose was whether the conversion had turned the houses into a public building within sections 78 and 79 of the Act.

Mr. Ryde argued to the contrary, and pointed out that the aged couples might have been lodged out separately. Could it then have been said that each house in which a pauper couple resided was a public building?—Mr. Paul Taylor: I am not dealing with suppositions. In this instance the building adjoins the workhouse, and is really part of it.

The master of the workhouse said that at present there were sixteen paupers and two attendants in the houses. In his opinion the number of inmates, if the houses had remained as ordinary private houses, would have been much greater. The additional buildings were part of the workhouse, and under the rules and regulations of the Local Government Board.

Mr. Alexander Finch, Architect to the Guardians, said that the alterations had been carried out with a view to insuring safety from fire for the inmates.

In the course of further argument Mr. Ryde quoted the case of *Josolyne* v. *Meeson*, in which it was held that an ambulance station erected in connection with Homerton Fever Hospital was not a public building.

Mr. Paul Taylor observed that the Act, section 5 (27), said that a workhouse was a "public building," and it seemed to him that this building was a wing of the workhouse.

Mr. Ryde said if that was the magistrate's view he should ask for an adjournment in order that the Guardians might apply to the London County Council to license the building, and thus exempt it from the provisions of the London Building Act. As a matter of fact, the County Council were of opinion that this was not a public building within the meaning of the Act, and they had withheld the license until the magistrate had decided the point.

Mr. Paul Taylor said he felt bound to find in favour of the District Surveyor, and he imposed a penalty of 1*s.* on each of two summonses which had been taken out.

### The London Building Act 1894.

At the North London Police Court, on 29th April, Messrs. Simpson, builders, of Roding Road, Homerton, were summoned before Mr. Paul Taylor for a contravention of the London Building Act 1894 (Part iii.) in erecting a building at the corner of Roding and Ashenden Roads beyond the building-line as defined by the superintending architect of the London County Council.

The summons was issued by Mr. Frederick Meeson, the District Surveyor, for whom Mr. Jutsum appeared.

Mr. Travers Humphreys, barrister, for the defendants, submitted that the building was carried out under a contract which was entered into before the passing of the Act of 1894.

The contract was produced, and it contained a provision that the buildings should be erected according to the provisions of the then existing Building Act, *or any future enactment regulating buildings.*

Mr. Jutsum submitted that that provision clearly brought the building under the Act of 1894.

This contention was disputed by the other side, and the magistrate held that the provision in the Act of 1894 (section 212) expressly exempting buildings erected under contracts entered into before the Act came into operation must apply to this case. He therefore dismissed the summons.

In a second case on the same day, before the same magistrate, the owner of No. 75, High Street, Stoke Newington, was summoned at the instance of the London County Council under the Dangerous Structure sections of the London Building Act.

Mr. Jesse Godfrey represented the Council; Mr. Lewis Thomas, barrister, defended.

Mr. Godfrey wished to withdraw the summons, as the work required to be done had been done.

Mr. Lewis Thomas asked for costs.

It was then explained that the dangerous structure was an arched cellar under the public footway, the walls of which had been rendered insecure by workmen in the employment of the Stoke Newington Vestry endeavouring to lower the level of the pavement. They had broken into the crown of the cellar, made the place dangerous, and had then served the owner with a notice that the place was dangerous. Finding, however, that they had no power in the matter, the Vestry communicated with the County Council, and this summons was issued simultaneously with a notice that the work would be done, the owner and the Vestry having meanwhile come to a satisfactory settlement. Notice was given to the District Surveyor that the work was in hand on 17th April; but still the summons was proceeded with, and the defendant, nine expert witnesses, and counsel were brought to the Court.

Mr. Godfrey said that he had heard from the District Surveyor only on entering the Court that the work had been done.

The magistrate said he thought that notice should have been sent to the Council by the Surveyor, so that they could have saved the defendant from going to any expense. He should hold that the Council were liable for the omission of their servant, and he should dismiss the summons, with £5. 5*s.* costs.